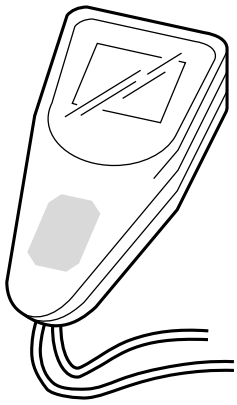
SERVICE MANUAL

MODEL	COMMANDER	DEST.	CHASSIS NO.
FDL-22		MX	

MODEL	COMMANDER	DEST.	CHASSIS NO.
FDL-22		WP	



MICROFILM

* Please file according to model size. ....□

2.2

LCD COLOR TV

SONY®

SPECIFICATIONS

TV standard M
Color system NTSC
Channel coverage
VHF: 2 - 13
UHF: 14 - 69
Antenna VHF/UHF strap antenna
Display format Transmission type TN liquid crystal panel
Drive format Passive matrix
Picture 2.2 inches measured diagonally
Output Headphones: minijack
Impedance 8 - 45 ohms
Power requirements
6 V DC
Power consumption
Approx. 3.2 W
Speaker ∅28 mm ($1\frac{1}{8}$ in.)
0.13 W
Temperature range
32 °F - 104 °F (0 °C - 40 °C)
Dimensions Approx. 81.1 x 153 x 43.4 mm (w/h/d)
($3\frac{1}{4} \times 6\frac{1}{8} \times 1\frac{3}{4}$ in.)
excl. projecting parts and controls
Strap length Approx.1,300 mm ($51\frac{1}{4}$ in.)
Mass Approx. 210 g (7.4 oz), excl. batteries
Battery life Approx. 3.5 hours with continuous use
Optional accessories
AC power adaptor AC-E60HG
Size AA (LR6) alkaline battery

Design and specifications are subject to change without notice.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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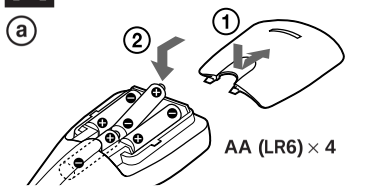
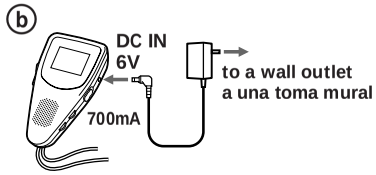
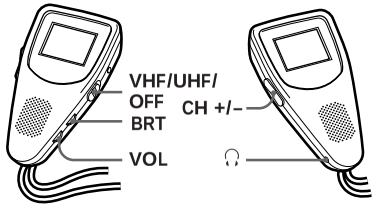
The operating instructions mentioned here are partial abstracts from the Operating Instruction Manual. The page numbers of the Operating Instruction Manual remein as in the manual.

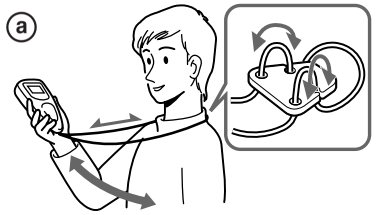
A

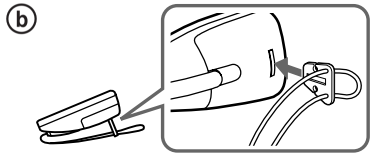




B



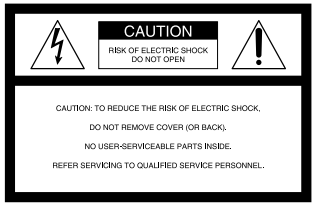




English

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Power Sources

Alkaline Batteries

See fig. A–ⓐ.

Battery Life: With continuous use, Sony LR6 alkaline batteries will last about 3.5 hours.

Note

When the picture becomes dimmer or the tuning does not lock into a channel, replace all the batteries with new ones.

House Current

See fig. A–ⓑ.

Note

Use only the recommended AC power adaptor. (For the polarity of the plug, see fig. A–ⓒ).

Operation (see fig. B)

1. Set the VHF/UHF/OFF switch to VHF or UHF whichever band you want to watch.
2. Press the CH +/– button to select a channel.
3. Adjust the volume with the VOL dial.
4. Adjust the brightness with the BRT dial.

To switch off the TV: Set the VHF/UHF/OFF switch to OFF.

To improve the broadcast reception: Extend the strap antenna and move the unit in every direction. You can also adjust the length of the strap. (See fig. B–ⓐ).

Listening with headphones: Connect headphones (not supplied) to the 🎧 (headphones) jack.

How to use the stand

See fig. B–ⓑ.

Precautions

- Operate the unit only on 6 V DC. For AC operation, use the recommended Sony AC power adaptor. Do not use any other type of AC power adaptors for this unit.
- Do not open the unit. Refer servicing to qualified personnel only.
- Do not place the unit in a hot or humid place or in a place subject to excessive dust or vibration.
- Avoid rough handling.
- Clean the unit with a soft cloth slightly dampened with a mild detergent solution. Never use strong solvents, such as thinner or benzine, as they may damage the finish.

Troubleshooting

The unit does not operate.

- The AC power adaptor is disconnected.
- Incorrect battery polarity.
- Weak batteries.

Herringbone pattern, double images, stripes, too indistinct, etc.

- Improper tuning or antenna setting.

Dotted lines or stripes

- Often caused by interference from other electric appliances.
- Adjust the strap antenna.

No sound from the speaker

- Volume is turned down completely.
- Weak batteries.

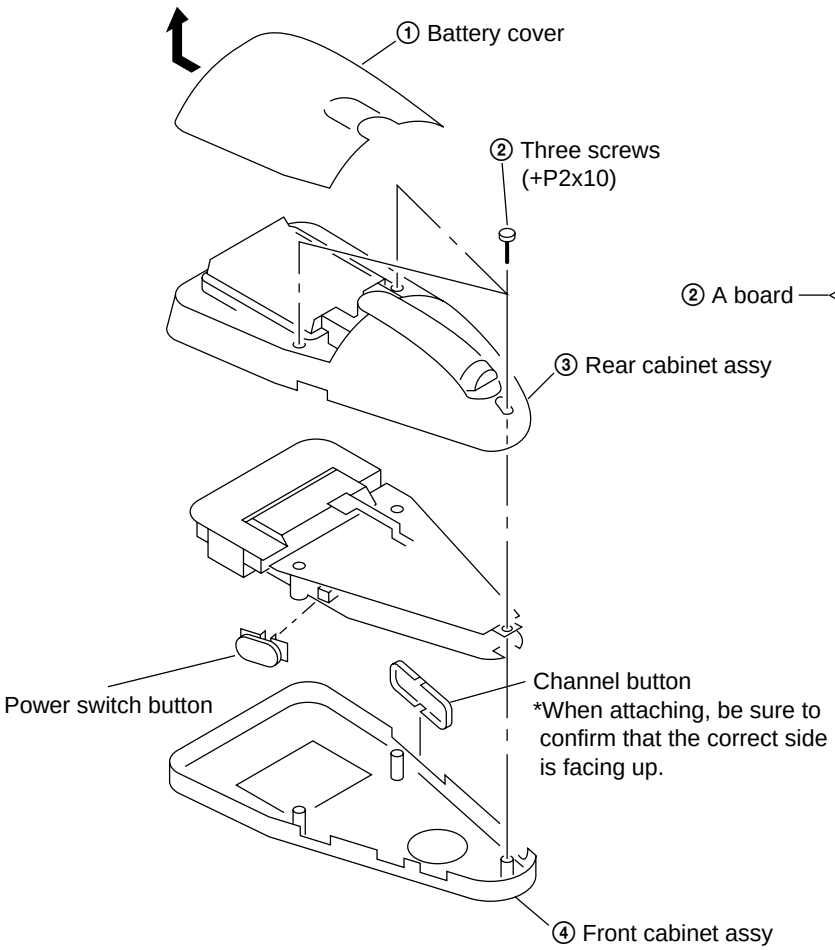
No picture

- Weak batteries.

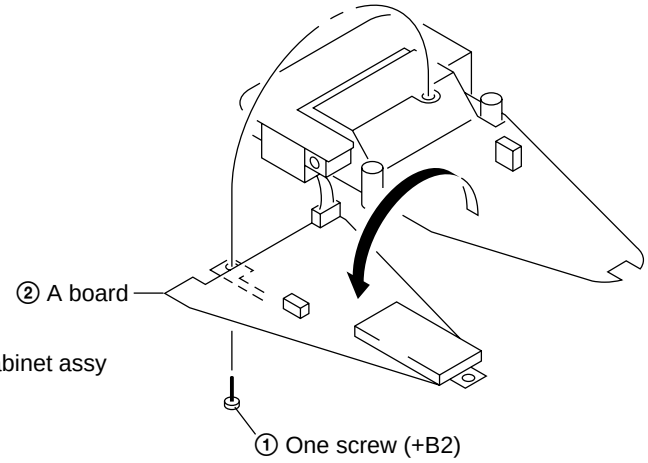
If you have any questions or problems concerning your unit, please consult your nearest Sony service facility.

SECTION 2
DISASSEMBLY

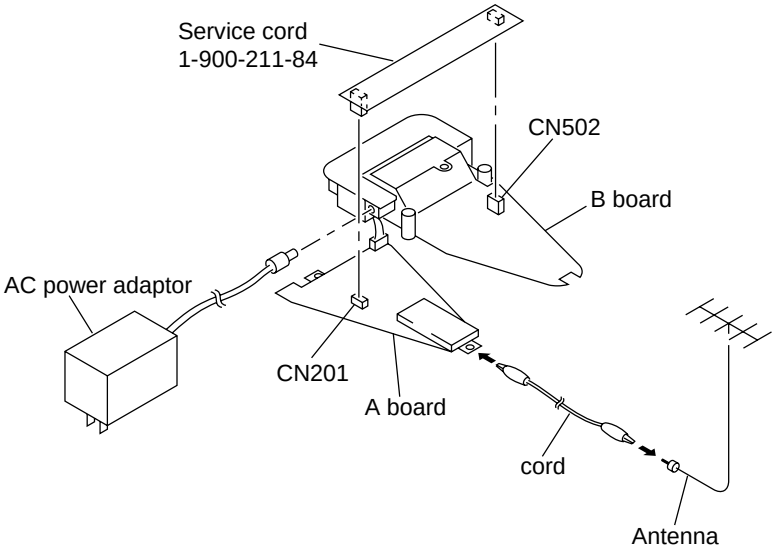
2-1. CABINET ASSY REMOVAL



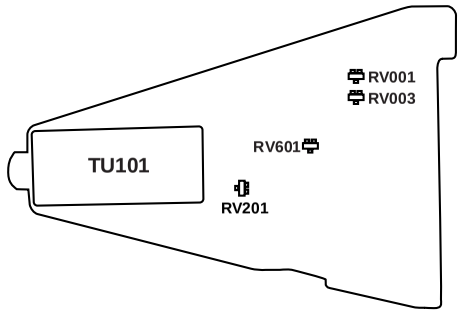
2-2. A BOARD REMOVAL



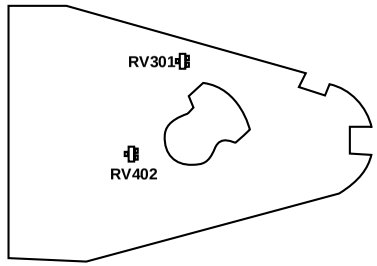
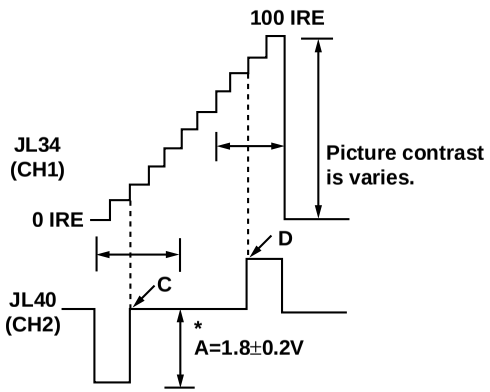
2-3. SERVICE POSITION

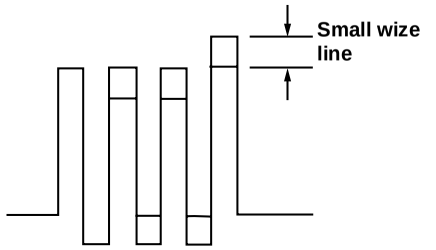
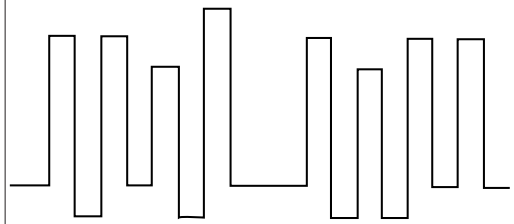


SECTION 3
CIRCUIT ADJUSTMENTS

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
A BOARD ADJUSTMENT **+4.5 ADJUSTMENT** Measure *JL with a *digital voltmeter and adjust *RV for the *Voltage.	*Digital Voltmeter	*JL61	*RV601	**– A BOARD – (COMPONENT SIDE)**  *4.55 ± 0.05 V DC

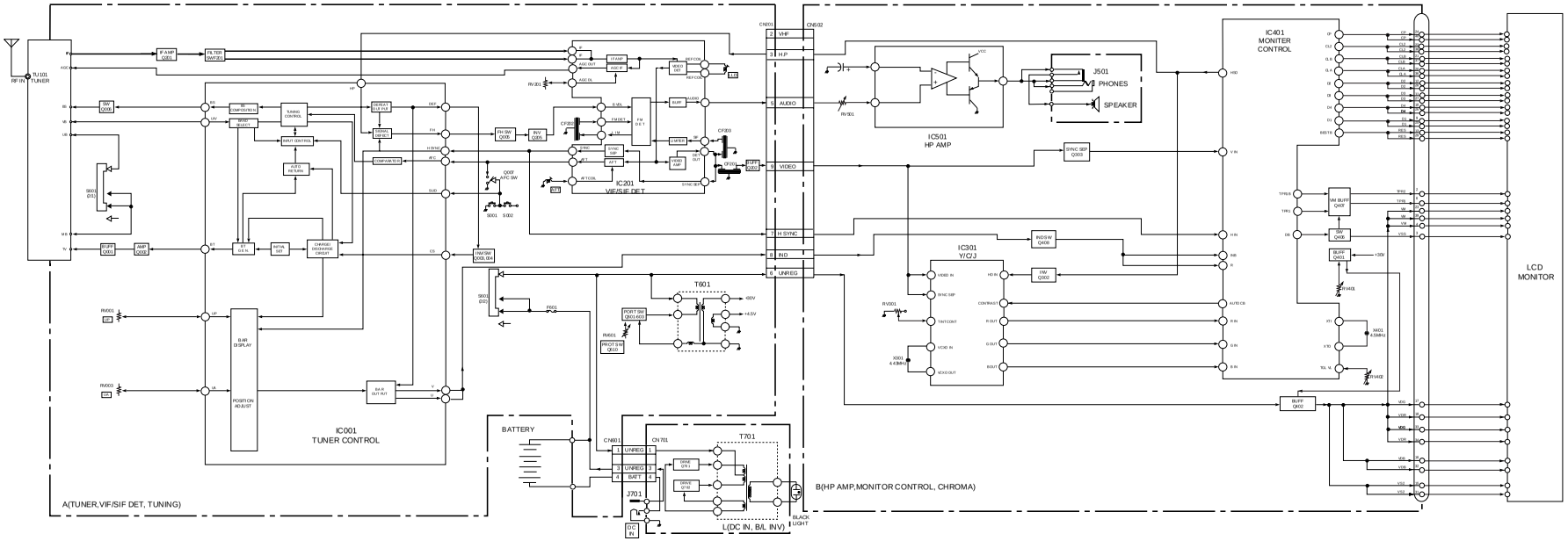
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
CHANNEL DISPLAY POSITION ADJUSTMENT				
1. Insert variable resister (47 kΩ) and resister (15 kΩ) between JL06 and JL61. (Fig 1.)				Fig 1.
2. Short circuitry between JL04 and JL60 (GND).				Fig 2.
3. Power switch in **I**.			S601	
4. Recieve 21CH then adjust channel No. display position by *RV to be in the *Specification.			*RV001	*Channel No. and display bar are to be in line.
5. Recieve 68CH then adjust channel No. display position by *RV to be in the *specification.			*RV003	*Channel No. and display bar are to be in line.
6. Repeat the procedures 9 and 10 in a few times to be in the specification for both of 21CH and 68CH.				
7. Recieve 40CH then check and confirm position of the display bar in the specification.				
8. Release the variable resister and resister out and open the short circuitry between JL04 and JL60.				

ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
B BOARD ADJUSTMENT **GRAY SCALE SIGNAL ADJUSTMENT**				**– B BOARD – (COMPONENT SIDE)** 
1. Receive a *signal	* 10-gradation gray scale			
2. Check and confirm waveform at *JL30 by *oscilloscope to be in the *specification.	* Oscilloscope	*JL30 (VIDEO)		*0.62 ± 0.05Vp-p (0 IRE - 100 IRE)
3. Connect oscilloscope CH1 to *JL34, then vary *RV and confirm picture contrast of screen changes relevantly.		*JL34(G)	*RV402	
4. Connect oscilloscope CH2 to *JL40, then adjust amplitude of A by *RV to be in the *specification.		*JL40 (AUTO C)	*RV402	
5. Connect oscilloscpe CH2 to *JL40 and confirm leading edges of C and D to be in the area of ⟷.		*JL40 (AUTO C)		

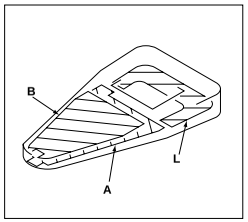
ADJUSTMENT ITEM AND PROCEDURE	EQUIPMENT AND SIGNAL	MEASUREMENT POSITION	ADJUSTMENT LOCATION	ILLUSTRATION AND SHAPE AND NUMBER
PHASE ADJUSTMENT 1. Receive a *signal. 2. Connect a *oscilloscope to *JL32. 3. Adjust waveform by *RV to be *Fig 3 or *Fig 4.	* Color-bar * Oscilloscope	*JL32 (B)	*RV301	 Fig 3.  Fig 4.

SECTION 4
DIAGRAMS

4-1. BLOCK DIAGRAM



4-2. CIRCUIT BOARDS LOCATION



4-3. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

Note:

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantaliums.
- All electrolytics are in 50V unless otherwise specified.
- All resistors are in ohms.
  k =1000 , M =1000k
- Indication of resistance, which dose not have one for rating electrical power, is as follows.

  Pitch : 5mm
  Rating electrical power : 1/4 W (CHIP : 1/10W)

- △ : internal component.
- ▭ : panel designation and adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- As to the voltage value shown by the semiconductors on the Shematic Diagram, see the another list.
- Readings are taken with a color-bar signal input.
- Readings are taken with a 10M digital multimeter .
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
  * : Measurement impossibility.
- ▭ : B+line.
- ▭ : signal path.
- Circled numbers are waveform references.

Reference information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NONFLAMMABLE CARBON
	: FUSE	NONFLAMMABLE FUSIBLE
	: RW	NONFLAMMABLE WIREWOUND
	: RS	NONFLAMMABLE METAL OXIDE
	: RB	NONFLAMMABLE CEMENT
	: ※	ADJUSTMENT RESISTOR
COIL	: LF-BL	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLYPROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

Note : The components identified by shading and mark △ are critical for safety. Replace only with part number specified.

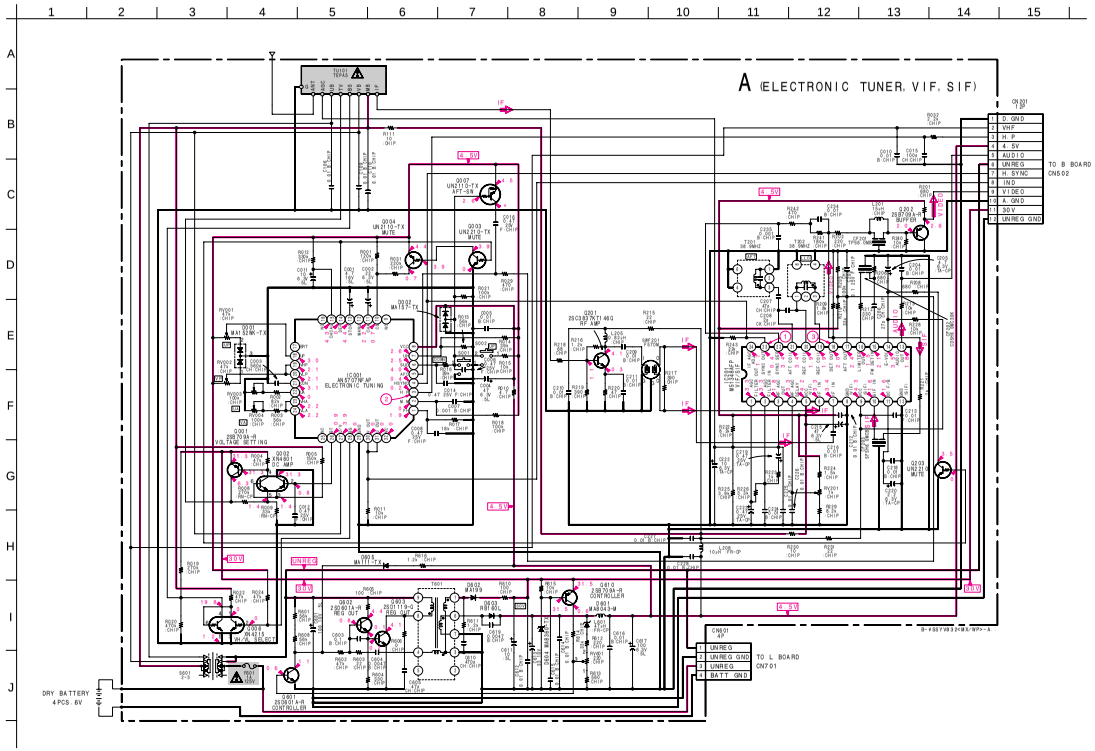
Terminal name of semiconductors in silk screen printed circuit (•)

	Device	Printed symbol	Terminal name	Circuit
①	Transistor		Collector Base Emitter	
②	Transistor		Collector Base Emitter	
③	Diode		Cathode Anode	
④	Diode		Cathode Anode (NC)	
⑤	Diode		Cathode Anode (NC)	
⑥	Diode		Common Anode Cathode	
⑦	Diode		Common Anode Cathode	
⑧	Diode		Common Cathode Anode	
⑨	Diode		Common Anode Anode	
⑩	Diode		Common Cathode Cathode	
⑪	Diode		Common Cathode Cathode	
⑫	Diode		Anode Cathode Anode Anode Cathode Anode	
⑬	Transistor (FET)		Drain Source Gate	
⑭	Transistor (FET)		Drain Source Gate	
⑮	Transistor (FET)		Source Drain Gate	
⑯	Transistor		Emitter Collector Base	
⑰	Transistor		C1 B1 E1 C2 B2 E2	
⑱	Transistor		C1 B1 E1 C2 B2 E2	
⑲	Transistor		C1 B1 E1 C2 B2 E2	
⑳	Transistor		C1 B1 E1 C2 B2 E2	
㉑	Transistor		C1 B1 E1 C2 B2 E2	
㉒	Transistor		C1 B1 E1 C2 B2 E2	
㉓	Transistor		C1 B1 E1 C2 B2 E2	
–	Discrete semiconductor			

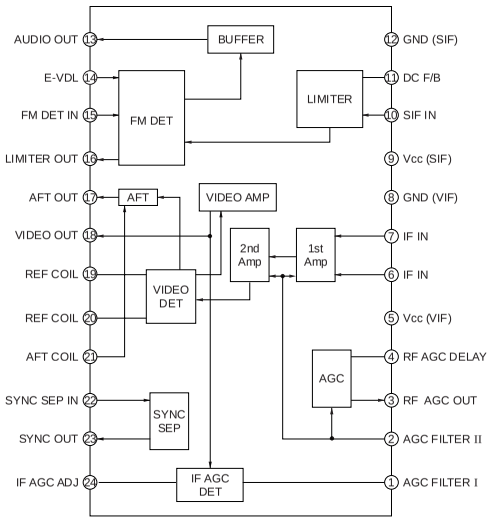
(Chip semiconductors that are not actually used are included.)

• A BOARD WAVEFORMS

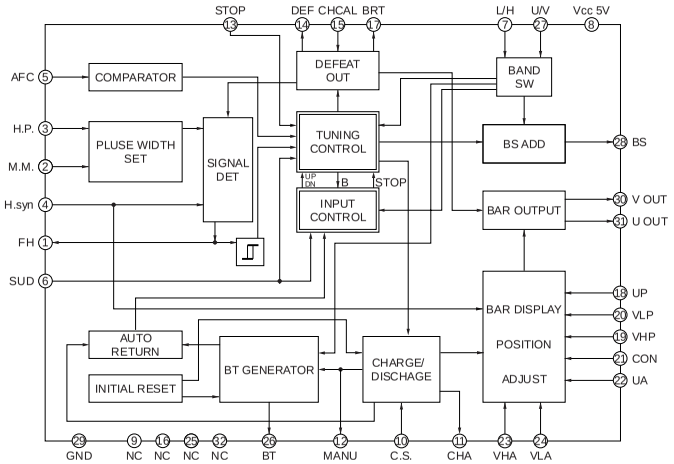
①	②	③
3.4Vp-p (H)	3.7Vp-p (H)	0.9Vp-p (H)



A BOARD : IC201 M51348AFP



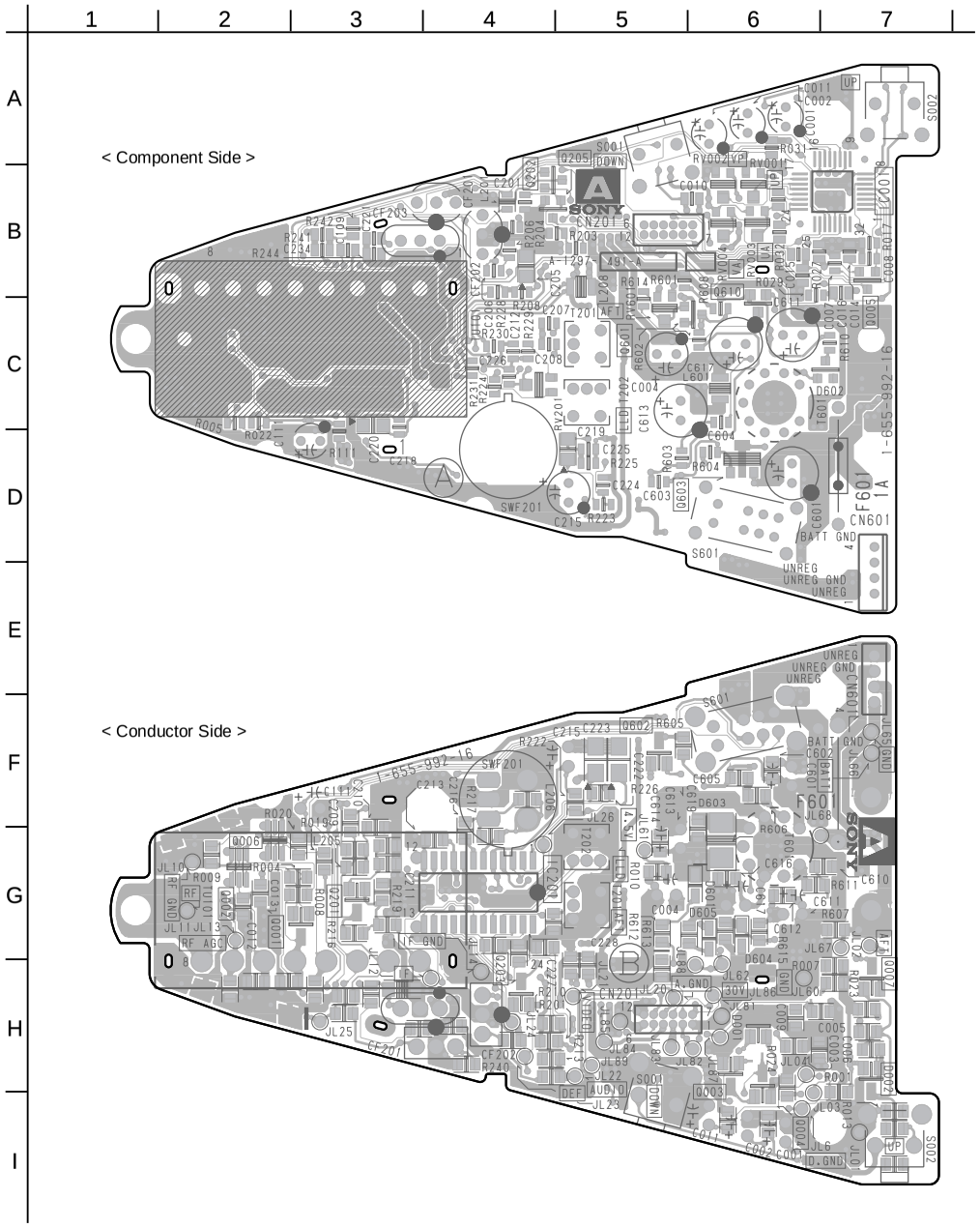
A BOARD : IC001 AN5707NFAP

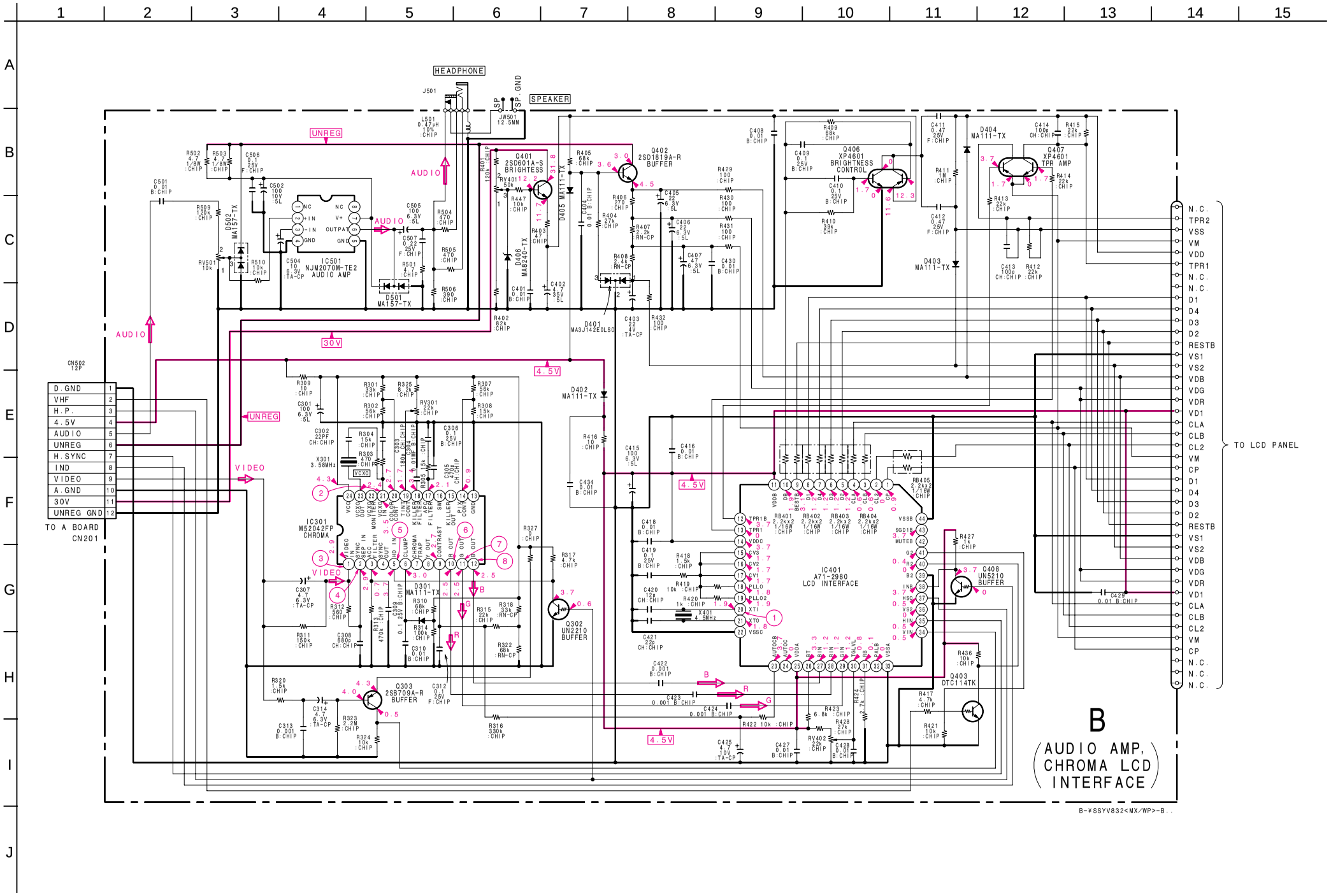


A BOARD

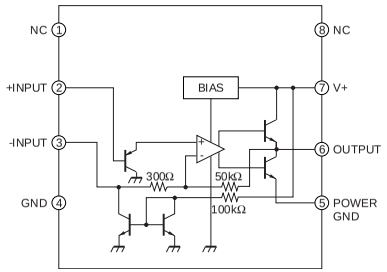
DIODE		*
D001	H-6	⑥
D002	I-7	④
D601	G-6	③
D602	C-7	⑥
D603	G-6	③
D604	G-6	③
D605	G-6	③
IC		
IC001	B-7	
IC201	G-4	
TRANSISTOR		*
Q001	G-3	①
Q002	G-2	⑫
Q003	H-6	①
Q004	I-6	①
Q006	G-2	⑪
Q007	H-7	①
Q201	G-3	①
Q202	B-5	②
Q203	H-4	①
Q601	C-6	②
Q602	F-5	①
Q603	D-6	②
Q610	C-6	②
VARIABLE RESISTOR		
RV001	B-6	
RV002	B-6	
RV003	B-6	
RV004	B-6	
RV201	C-4	
RV601	C-5	

– A BOARD –




HEADPHONE
SPEAKER
UNREG
AUDIO
30V
4.5V
VIDEO
IC501 NJM2070M-TE2 AUDIO AMP
IC301 M52042FP CHROMA
IC401 A71-2980 LCD INTERFACE
Q401 2SD601A-S BRIGHTESS
Q402 2SD1819A-R BUFFER
Q406 XP4601 BRIGHTNESS CONTROL
Q407 XP4601 TPR AMP
Q408 UN5210 BUFFER
Q403 DTC114TK
Q302 UN2210 BUFFER
Q303 2SB709A-R BUFFER
D401 MA3J142E0LS0
D402 MA111-TX
D403 MA111-TX
D404 MA111-TX
D405 MA111-TX
D406 MA8240-TX
D501 MA157-TX
D502 MA157-TX
D301 MA111-TX
CN502 12P
D.GND 1
VHF 2
H.P. 3
4.5V 4
AUDIO 5
UNREG 6
H.SYNC 7
IND 8
VIDEO 9
A.GND 10
30V 11
UNREG GND 12
TO A BOARD CN201
N.C.
TPR2
VSS
VM
VDD
TPR1
N.C.
N.C.
D1
D4
D3
D2
RESTB
VS1
VS2
VDB
VDG
VDR
VD1
CLA
CLB
CL2
VM
CP
D1
D4
D3
D2
RESTB
VS1
VS2
VDB
VDG
VDR
VD1
CLA
CLB
CL2
VM
CP
N.C.
N.C.
N.C.
TO LCD PANEL
B
AUDIO AMP, CHROMA LCD INTERFACE
B-¥SSYV832<MX/WP>-B..

B BOARD : IC501 NJM2070M



• B BOARD WAVEFORMS

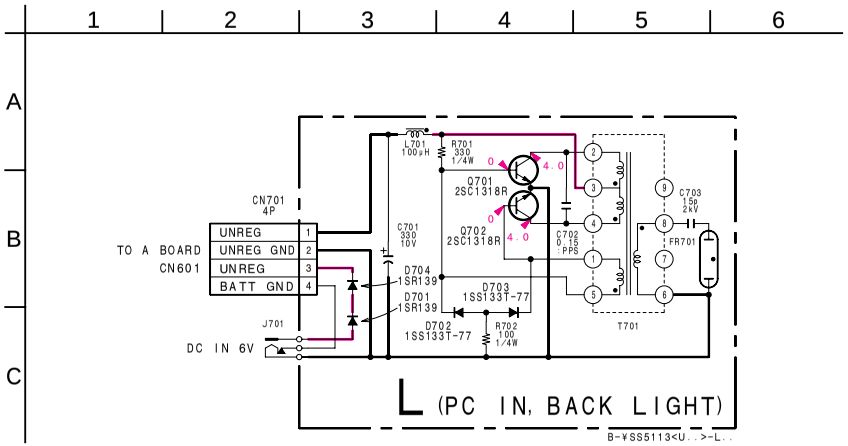
① 4.8Vp-p (4.5MHz)	② 0.4Vp-p (3.58MHz)	③ 0.9Vp-p (H)	④ 0.8Vp-p (H)
⑤ 4.2Vp-p (H)	⑥ 0.7Vp-p (H)	⑦ 0.9Vp-p (H)	⑧ 0.9Vp-p (H)

B BOARD

DIODE		*
D301	B-3	③
D401	D-2	⑦
D402	G-2	③
D403	B-1	③
D404	H-2	④
D405	E-2	③
D406	E-3	③
D501	C-5	⑤
D502	C-5	⑤
IC		
IC301	B-3	
IC401	C-2	
IC501	C-5	
TRANSISTOR		*
Q302	G-3	①
Q303	C-3	②
Q401	E-3	①
Q402	D-2	②
Q403	G-2	①
Q406	A-2	⑬
Q407	A-2	⑬
Q408	B-2	②
VARIABLE RESISTOR		
RV301	B-3	
RV401	D-3	
RV402	C-3	
RV501	D-4	

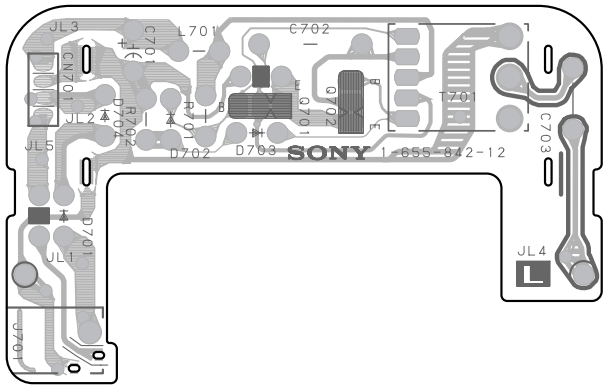
B [AUDIO AMP, CHROMA, LCD INTERFACE]

– B BOARD –



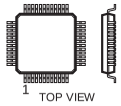
[L] [DC IN, BACK LIGHT]

– L BOARD –



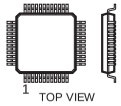
4-4. SEMICONDUCTORS

A71-2980



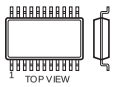
44 pin QFP

AN5707NFAP



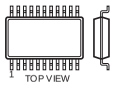
32 pin QFP

M51348AFP
M52045FP



24 pin SOP

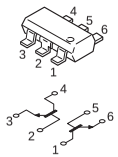
NJM2070M



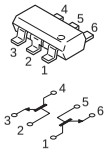
8 pin SOP

UN2110
UN211D
UN2210
UN5210
2SB709A
2SC3837KQ
2SD601A

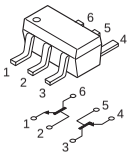
XN4215



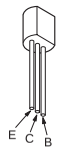
XN4601



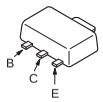
XP4601



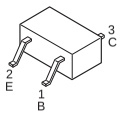
2SC1318R



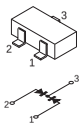
2SD1119-Q



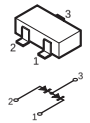
2SD1819A



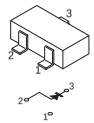
MA152WK
MA3J142E0LS0
1SS184



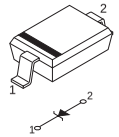
MA157
1SS226



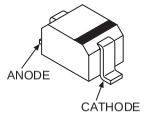
MA199



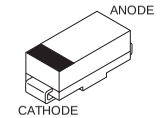
MA8043



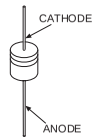
MA111
MA8240
MA8360



RB160L-40TE25



1SR139-400
1SS133T



SECTION 5
EXPLODED VIEW

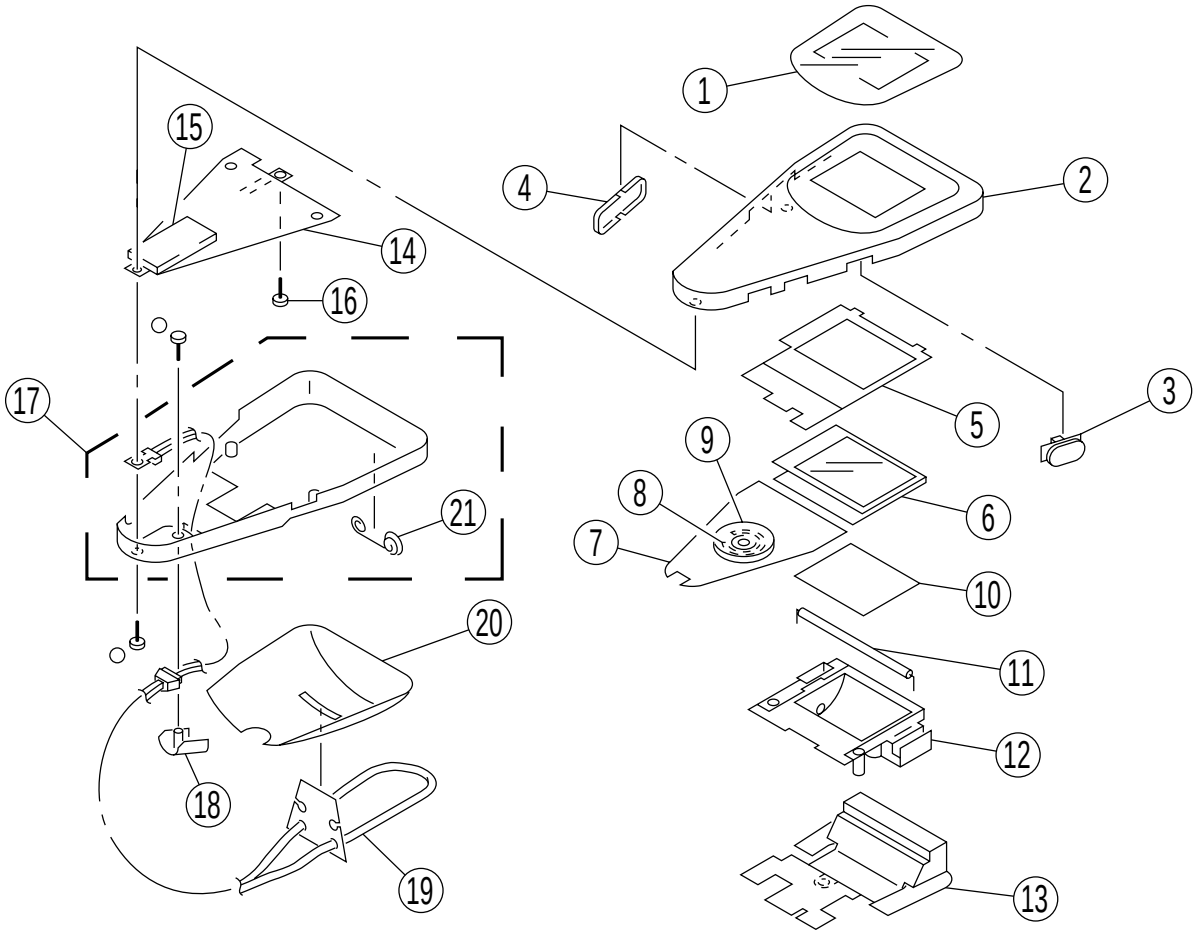
NOTE:

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CHASSIS

○ : 7-685-106-19 +P2 X10



REF. NO.	PART NO.	DESCRIPTION	REMARK
1	4-048-324-01	FILTER	
2	X-4032-638-4	CABINET ASSY, FRONT	
3	4-048-321-01	SWITCH, POWER	
4	4-048-322-01	BUTTON, CHANNEL	
5	* 4-048-327-01	SHIELD, PANEL	
6	1-810-873-12	MODULE, INDICATOR	
7	* A-1135-818-A	B BOARD, COMPLETE	
8	1-504-847-11	SPEAKER (2.8CM)	
9	4-048-551-01	SPACER, SPEAKER	
10	* 4-048-325-01	ILLUMINATOR	
11	1-517-425-13	LIGHT, BACK	
12	* 4-048-317-01	REFLECTOR	
13	* A-1394-649-A	L BOARD, COMPLETE	
14	* A-1297-491-A	A BOARD, COMPLETE	
15	⚠ 1-693-219-11	TUNER UNIT (TEPA5)	
16	4-908-792-51	SCREW (B2)	
17	X-4032-639-4	CABINET ASSY, REAR	21
18	4-048-323-01	COVER, ANTENNA	
19	1-501-767-11	ANTENNA, STRAP	
20	4-048-320-01	COVER, BATTERY	
21	4-048-468-01	SPRING (B), BATTERY	

SECTION 6
ELECTRICAL PARTS LIST

B

NOTE:

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

- CAPACITORS
  PF : μμ F
- There are some cases the reference number on one board overlaps on the other board. Therefore, when ordering parts by the reference number, please include the board name.

REF. NO.	PART NO.	DESCRIPTION			REMARK
	* A-1135-818-A	B BOARD, COMPLETE			
		**********			
		<CAPACITOR>			
C301	1-124-584-00	ELECT	100MF	20%	6.3V
C302	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C303	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C304	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C305	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C306	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C307	1-135-181-21	TANTAL. CHIP	4.7MF	20%	6.3V
C308	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C309	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C310	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C312	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C313	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C314	1-135-181-21	TANTAL. CHIP	4.7MF	20%	6.3V
C401	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C402	1-124-259-11	ELECT	4.7MF	20%	35V
C403	1-104-847-11	TANTAL. CHIP	22MF	20%	4V
C404	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C405	1-126-153-11	ELECT	22MF	20%	6.3V
C406	1-126-153-11	ELECT	22MF	20%	6.3V
C407	1-124-589-11	ELECT	47MF	20%	6.3V
C408	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C409	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C410	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C411	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C412	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C413	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C414	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C415	1-124-584-00	ELECT	100MF	20%	6.3V
C416	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C418	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C419	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C420	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C421	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C422	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C423	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C424	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C425	1-135-210-11	TANTAL. CHIP	4.7MF	20%	10V
C427	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C428	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C429	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C430	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C434	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C501	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C502	1-124-584-00	ELECT	100MF	20%	10V
C504	1-135-259-11	TANTAL. CHIP	10MF	20%	6.3V
C505	1-124-584-00	ELECT	100MF	20%	6.3V
C506	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C507	1-164-222-11	CERAMIC CHIP	0.22MF		25V

REF. NO.	PART NO.	DESCRIPTION			REMARK
		<CONNECTOR>			
CN502	1-770-606-11	CONNECTOR, BOARD TO BOARD 12P			
		<DIODE>			
D301	8-719-404-50	DIODE MA111-TX			
D401	8-719-059-51	DIODE MA3J142E0LSO			
D402	8-719-404-50	DIODE MA111-TX			
D403	8-719-404-50	DIODE MA111-TX			
D404	8-719-404-50	DIODE MA111-TX			
D405	8-719-404-50	DIODE MA111-TX			
D406	8-719-018-04	DIODE MA8240-TX			
D501	8-719-800-76	DIODE 1SS226			
D502	8-719-800-76	DIODE 1SS226			
		<IC>			
IC301	8-759-332-45	IC M52045FP			
IC401	8-759-368-68	IC A71-2980			
IC501	8-759-046-84	IC NJM2070M			
		<JACK>			
J501	1-563-282-11	JACK, SMALL TYPE			
		<COIL>			
L501	1-412-935-11	INDUCTOR 0.47UH			
		<TRANSISTOR>			
Q302	8-729-424-76	TRANSISTOR UN2210			
Q303	8-729-422-37	TRANSISTOR 2SB709A-R			
Q401	8-729-422-29	TRANSISTOR 2SD601A-S			
Q402	8-729-402-32	TRANSISTOR 2SD1819A-R			
Q403	8-729-902-99	TRANSISTOR DTC114TK			
Q406	8-729-427-74	TRANSISTOR XP4601			
Q407	8-729-427-74	TRANSISTOR XP4601			
Q408	8-729-420-44	TRANSISTOR UN5210			
		<RESISTOR>			
R301	1-216-085-00	RES,CHIP	33K	5%	1/10W
R302	1-216-091-00	RES,CHIP	56K	5%	1/10W
R303	1-216-041-00	RES,CHIP	470	5%	1/10W
R304	1-216-061-00	RES,CHIP	3.3K	5%	1/10W
R305	1-216-077-00	RES,CHIP	15K	5%	1/10W
R307	1-216-091-00	RES,CHIP	56K	5%	1/10W
R308	1-216-077-00	RES,CHIP	15K	5%	1/10W
R309	1-216-001-00	RES,CHIP	10	5%	1/10W
R310	1-216-093-91	RES,CHIP	68K	5%	1/10W
R311	1-216-101-00	RES,CHIP	150K	5%	1/10W
R312	1-216-043-91	RES,CHIP	560	5%	1/10W

B A

REF. NO.	PART NO.	DESCRIPTION			REMARK
R313	1-216-113-00	RES,CHIP	470K	5%	1/10W
R314	1-216-097-91	RES,CHIP	100K	5%	1/10W
R315	1-216-081-00	RES,CHIP	22K	5%	1/10W
R316	1-216-109-00	RES,CHIP	330K	5%	1/10W
R317	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R318	1-216-687-11	METAL CHIP	33K	0.50%	1/10W
R320	1-216-053-00	RES,CHIP	1.5K	5%	1/10W
R322	1-216-695-11	METAL CHIP	68K	0.50%	1/10W
R323	1-216-129-00	RES,CHIP	2.2M	5%	1/10W
R324	1-216-073-00	RES,CHIP	10K	5%	1/10W
R325	1-216-071-00	RES,CHIP	8.2K	5%	1/10W
R327	1-216-295-91	SHORT	0		
R401	1-216-099-00	RES,CHIP	120K	5%	1/10W
R402	1-216-095-00	RES,CHIP	82K	5%	1/10W
R403	1-216-017-91	RES,CHIP	47	5%	1/10W
R404	1-216-083-00	RES,CHIP	27K	5%	1/10W
R405	1-216-093-91	RES,CHIP	68K	5%	1/10W
R406	1-216-035-00	RES,CHIP	270	5%	1/10W
R407	1-216-659-11	METAL CHIP	2.2K	0.50%	1/10W
R408	1-216-660-11	METAL CHIP	2.4K	0.50%	1/10W
R409	1-216-093-91	RES,CHIP	68K	5%	1/10W
R410	1-216-689-11	RES,CHIP	39K	5%	1/10W
R411	1-216-121-91	RES,CHIP	1M	5%	1/10W
R412	1-216-081-00	RES,CHIP	22K	5%	1/10W
R413	1-216-081-00	RES,CHIP	22K	5%	1/10W
R414	1-216-081-00	RES,CHIP	22K	5%	1/10W
R415	1-216-081-00	RES,CHIP	22K	5%	1/10W
R416	1-216-001-00	RES,CHIP	10	5%	1/10W
R417	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R418	1-216-053-00	RES,CHIP	1.5K	5%	1/10W
R419	1-216-073-00	RES,CHIP	10K	5%	1/10W
R420	1-216-049-91	RES,CHIP	1K	5%	1/10W
R421	1-216-073-00	RES,CHIP	10K	5%	1/10W
R422	1-216-073-00	RES,CHIP	10K	5%	1/10W
R423	1-216-069-00	RES,CHIP	6.8K	5%	1/10W
R424	1-216-059-00	RES,CHIP	2.7K	5%	1/10W
R427	1-216-049-91	RES,CHIP	1K	5%	1/10W
R428	1-216-083-00	RES,CHIP	27K	5%	1/10W
R429	1-216-025-91	RES,CHIP	100	5%	1/10W
R430	1-216-025-91	RES,CHIP	100	5%	1/10W
R431	1-216-025-91	RES,CHIP	100	5%	1/10W
R432	1-216-025-91	RES,CHIP	100	5%	1/10W
R436	1-216-073-00	RES,CHIP	10K	5%	1/10W
R447	1-216-073-00	RES,CHIP	10K	5%	1/10W
R501	1-216-308-00	RES,CHIP	4.7	5%	1/10W
R502	1-216-142-00	RES,CHIP	4.7	5%	1/8W
R503	1-216-142-00	RES,CHIP	4.7	5%	1/8W
R504	1-216-041-00	RES,CHIP	470	5%	1/10W
R505	1-216-041-00	RES,CHIP	470	5%	1/10W
R506	1-216-039-00	RES,CHIP	390	5%	1/10W
R509	1-216-099-00	RES,CHIP	120K	5%	1/10W
R510	1-216-073-00	RES,CHIP	10K	5%	1/10W

<RESISTOR BLOCK>

RB401	1-233-788-11	RES, NETWORK 2.2K
RB402	1-233-788-11	RES, NETWORK 2.2K
RB403	1-233-788-11	RES, NETWORK 2.2K
RB404	1-233-788-11	RES, NETWORK 2.2K
RB405	1-233-788-11	RES, NETWORK 2.2K

<VARIABLE RESISTOR>

RV301	1-223-587-11	RES, ADJ, CARBON 22K
RV401	1-223-901-21	RES, VAR 50K
RV402	1-223-587-11	RES, ADJ, CARBON 22K
RV501	1-223-900-21	RES, VAR 10K

REF. NO.	PART NO.	DESCRIPTION			REMARK
		<CRYSTAL>			
X301	1-567-505-41	OSCILLATOR, CRYSTAL			
X401	1-760-601-21	VIBRATOR, CRYSTAL			

****

* A-1297-491-A A BOARD, COMPLETE

****

<CAPACITOR>

C001	1-124-259-11	ELECT	4.7MF	20%	16V
C002	1-126-153-11	ELECT	22MF	20%	6.3V
C003	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C004	1-124-589-11	ELECT	47MF	20%	6.3V
C005	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C006	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C007	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C008	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C010	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C011	1-126-157-11	ELECT	10MF	20%	6.3V
C012	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C014	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C015	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C016	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C106	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C109	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C110	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C203	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C204	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C205	1-135-181-21	TANTAL. CHIP	4.7MF	20%	6.3V
C206	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C207	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C208	1-163-085-00	CERAMIC CHIP	2PF	0.25PF	50V
C209	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C210	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C211	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C212	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C213	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C215	1-124-589-11	ELECT	47MF	20%	6.3V
C216	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C218	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C219	1-135-145-11	TANTAL. CHIP	0.47MF	20%	25V
C220	1-135-149-21	TANTAL. CHIP	2.2MF	20%	6.3V
C222	1-135-259-11	TANTAL. CHIP	10MF	20%	6.3V
C223	1-135-145-11	TANTAL. CHIP	0.47MF	20%	25V
C224	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C225	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C226	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C227	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C228	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C234	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C235	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C601	1-124-584-00	ELECT	100MF	20%	10V
C603	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C604	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C605	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C610	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C611	1-124-261-00	ELECT	10MF	20%	50V
C612	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C613	1-127-561-11	ELECT	33MF	20%	10V
C614	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C615	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C616	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C617	1-124-584-00	ELECT	100MF	20%	6.3V
C619	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V

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The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

REF. NO.	PART NO.	DESCRIPTION	REMARK
		<FILTER>	
CF201	1-409-332-00	CERAMIC TRAP	
CF202	1-760-642-11	DISCRIMINATOR, CERAMIC	
CF203	1-577-559-21	FILTER, CERAMIC	
		<CONNECTOR>	
CN201	* 1-770-605-11	CONNECTOR, BOARD TO BOARD 12P	
CN601	* 1-770-590-11	PIN, CONNECTOR (PC BOARD)	
		<DIODE>	
D001	8-719-801-78	DIODE 1SS184	
D002	8-719-800-76	DIODE 1SS226	
D601	8-719-421-82	DIODE MA8043-M	
D602	8-719-027-72	DIODE MA199-(TX)	
D603	8-719-048-98	DIODE RB160L-40TE25	
D604	8-719-018-15	DIODE MA8360	
D605	8-719-404-50	DIODE MA111-TX	
		<FUSE>	
F601	⚠ 1-533-631-31	FUSE, MICRO	
		<IC>	
IC001	8-759-332-43	IC AN5707NFAP	
IC201	8-759-176-91	IC M51348AFP	
		<COIL>	
L201	1-412-008-31	INDUCTOR CHIP 15UH	
L205	1-410-992-11	INDUCTOR CHIP 0.82UH	
L208	1-412-029-11	INDUCTOR CHIP 10UH	
L601	1-412-031-11	INDUCTOR CHIP 47UH	
		<TRANSISTOR>	
Q001	8-729-422-37	TRANSISTOR 2SB709A-R	
Q002	8-729-402-84	TRANSISTOR XN4601	
Q003	8-729-424-76	TRANSISTOR UN2210	
Q004	8-729-424-38	TRANSISTOR UN2110	
Q006	8-729-422-54	TRANSISTOR XN4215	
Q007	8-729-424-45	TRANSISTOR UN211D-TX	
Q201	8-729-031-37	TRANSISTOR 2SC3837KQ	
Q202	8-729-422-37	TRANSISTOR 2SB709A-R	
Q203	8-729-424-76	TRANSISTOR UN2210	
Q601	8-729-422-29	TRANSISTOR 2SD601A-S	
Q602	8-729-422-29	TRANSISTOR 2SD601A-S	
Q603	8-729-421-15	TRANSISTOR 2SD1119-Q	
Q610	8-729-422-37	TRANSISTOR 2SB709A-R	
		<RESISTOR>	
R001	1-216-099-00	RES,CHIP 120K 5% 1/10W	
R002	1-216-095-00	RES,CHIP 82K 5% 1/10W	
R003	1-216-091-00	RES,CHIP 56K 5% 1/10W	
R004	1-216-089-91	RES,CHIP 47K 5% 1/10W	
R005	1-216-101-00	RES,CHIP 150K 5% 1/10W	
R008	1-218-762-11	METAL CHIP 270K 0.50% 1/10W	
R009	1-216-687-11	METAL CHIP 33K 0.50% 1/10W	
R010	1-216-308-00	RES,CHIP 4.7 5% 1/10W	
R011	1-216-073-00	RES,CHIP 10K 5% 1/10W	
R012	1-216-109-00	RES,CHIP 330K 5% 1/10W	
R013	1-216-091-00	RES,CHIP 56K 5% 1/10W	
R014	1-216-689-11	RES,CHIP 39K 5% 1/10W	
R015	1-216-073-00	RES,CHIP 10K 5% 1/10W	
R016	1-216-689-11	RES,CHIP 39K 5% 1/10W	
R017	1-216-079-00	RES,CHIP 18K 5% 1/10W	
R018	1-216-097-91	RES,CHIP 100K 5% 1/10W	
R019	1-216-107-00	RES,CHIP 270K 5% 1/10W	
R020	1-216-113-00	RES,CHIP 470K 5% 1/10W	
R021	1-216-097-91	RES,CHIP 100K 5% 1/10W	
R022	1-216-089-91	RES,CHIP 47K 5% 1/10W	
R024	1-216-089-91	RES,CHIP 47K 5% 1/10W	
R029	1-216-041-00	RES,CHIP 470 5% 1/10W	
R031	1-216-105-91	RES,CHIP 220K 5% 1/10W	
R032	1-216-057-00	RES,CHIP 2.2K 5% 1/10W	
R111	1-216-001-00	RES,CHIP 10 5% 1/10W	
R201	1-216-045-00	RES,CHIP 680 5% 1/10W	
R202	1-216-033-00	RES,CHIP 220 5% 1/10W	
R205	1-216-097-91	RES,CHIP 100K 5% 1/10W	
R206	1-216-045-00	RES,CHIP 680 5% 1/10W	
R208	1-216-045-00	RES,CHIP 680 5% 1/10W	
R209	1-216-055-00	RES,CHIP 1.8K 5% 1/10W	
R210	1-216-085-00	RES,CHIP 33K 5% 1/10W	
R212	1-216-037-00	RES,CHIP 330 5% 1/10W	
R213	1-216-073-00	RES,CHIP 10K 5% 1/10W	
R215	1-216-009-91	RES,CHIP 22 5% 1/10W	
R216	1-216-051-00	RES,CHIP 1.2K 5% 1/10W	
R217	1-216-039-00	RES,CHIP 390 5% 1/10W	
R218	1-216-021-00	RES,CHIP 68 5% 1/10W	
R219	1-216-039-00	RES,CHIP 390 5% 1/10W	
R220	1-216-017-91	RES,CHIP 47 5% 1/10W	
R221	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R222	1-216-071-00	RES,CHIP 8.2K 5% 1/10W	
R223	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R224	1-216-053-00	RES,CHIP 1.5K 5% 1/10W	
R225	1-216-063-91	RES,CHIP 3.9K 5% 1/10W	
R226	1-216-061-00	RES,CHIP 3.3K 5% 1/10W	
R228	1-216-073-00	RES,CHIP 10K 5% 1/10W	
R229	1-216-071-00	RES,CHIP 8.2K 5% 1/10W	
R230	1-216-001-00	RES,CHIP 10 5% 1/10W	
R231	1-216-009-91	RES,CHIP 22 5% 1/10W	
R240	1-216-073-00	RES,CHIP 10K 5% 1/10W	
R241	1-216-103-00	RES,CHIP 180K 5% 1/10W	
R242	1-216-041-00	RES,CHIP 470 5% 1/10W	
R243	1-216-081-00	RES,CHIP 22K 5% 1/10W	
R601	1-216-091-00	RES,CHIP 56K 5% 1/10W	
R602	1-216-089-91	RES,CHIP 47K 5% 1/10W	
R603	1-216-009-91	RES,CHIP 22 5% 1/10W	
R604	1-216-037-00	RES,CHIP 330 5% 1/10W	
R605	1-216-025-91	RES,CHIP 100 5% 1/10W	
R606	1-216-295-91	SHORT 0	
R608	1-216-091-00	RES,CHIP 56K 5% 1/10W	
R610	1-216-025-91	RES,CHIP 100 5% 1/10W	
R611	1-216-051-00	RES,CHIP 1.2K 5% 1/10W	
R612	1-216-033-00	RES,CHIP 220 5% 1/10W	
R613	1-216-043-91	RES,CHIP 560 5% 1/10W	
R614	1-216-085-00	RES,CHIP 33K 5% 1/10W	
R615	1-216-073-00	RES,CHIP 10K 5% 1/10W	
R616	1-216-051-00	RES,CHIP 1.2K 5% 1/10W	
		<VARIABLE RESISTOR>	
RV001	1-223-588-11	RES, ADJ, CARBON 47K	
RV002	1-223-588-11	RES, ADJ, CARBON 47K	
RV003	1-223-598-11	RES, VAR, CARBON 100K	
RV004	1-223-598-11	RES, VAR, CARBON 100K	
RV201	1-223-583-11	RES, ADJ, CARBON 1K	
RV601	1-223-581-11	RES, ADJ, CARBON 220	
		<SWITCH>	
S001	1-571-532-21	SWITCH, TACTIL	
S002	1-571-532-21	SWITCH, TACTIL	
S601	1-762-368-11	SWITCH, SLIDE	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

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REF. NO.	PART NO.	DESCRIPTION			REMARK
		<FILTER>			
SWF201	1-760-373-11	SAWF			
		<TRANSFORMER>			
T201	1-411-278-11	COIL			
T202	1-411-278-11	COIL			
T601	1-427-919-11	TRANSFORMER, DC-DC CONVERTER			
		<TUNER>			
TU101	⚠ 1-693-219-11	TUNER UNIT (TEPA5)			
**********					
*	A-1394-649-A	L BOARD, COMPLETE **********			
		<CAPACITOR>			
C701	1-126-924-11	ELECT	330MF	20%	10V
C702	1-111-262-11	FILM	0.15MF	5%	50V
C703	1-109-878-11	CERAMIC	15PF	5%	2KV
		<DIODE>			
D701	8-719-970-02	DIODE 1SR139-400			
D702	8-719-991-33	DIODE 1SS133T-77			
D703	8-719-991-33	DIODE 1SS133T-77			
D704	8-719-970-02	DIODE 1SR139-400			
		<JACK>			
J701	1-568-907-21	JACK,DC(POLARITY UNIFIED TYPE)			
		<COIL>			
L701	1-412-537-31	INDUCTOR 100UH			
		<TRANSISTOR>			
Q701	8-729-140-96	TRANSISTOR 2SD774-34			
Q702	8-729-140-96	TRANSISTOR 2SD774-34			
		<RESISTOR>			
R701	1-249-411-11	CARBON	330	5%	1/4W
R702	1-247-807-31	CARBON	100	5%	1/4W
		<TRANSFORMER>			
T701	1-427-918-11	TRANSFORMER, CONVERTER			
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REF. NO.	PART NO.	DESCRIPTION	REMARK
		MISCELLANEOUS **********	
	1-501-767-11	ANTENNA, STRAP	
	1-504-847-11	SPEAKER (2.8CM)	
	1-517-425-11	LIGHT, BACK	
	1-810-873-11	MODULE, INDICATOR	
**********			
		ACCESSORIES AND PACKING MATERIALS **********	
*	4-048-191-02	HOLDER	
*	4-048-192-01	BLISTER	
	4-561-210-01	CARD BOARD	

9-965-032-11

Sony Ichinomiya Corporation
Quality Assurance Division

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